

and authorization for the Commissioner to charge any necessary fee to Deposit Account No. 19-0089.

Entry of the following amendment and reconsideration and withdrawal of the rejections of record are requested.

IN THE CLAIMS

Please amend claims 12, 18 and 30 by replacing these claims with the following amended claims, with a marked up copy of the claims being attached in the Appendix to the Office Action.

112. (Thrice Amended) A reforming apparatus comprising an integrated structure of three separate units, comprising:

a raw material reforming unit for steam-reforming a raw material to be reformed and producing a reformed gas containing hydrogen as a principal component, including a heat source that generates heat by combustion of a fuel gas, operable to directly obtain heat for the steam reformation reaction from said heat source;

a shift reaction unit for decreasing, by water-gas-shift reaction, CO contained in the reformed gas produced in said raw material reforming unit; and

a CO oxidation unit for further decreasing, by oxidation, CO contained in reformed gas treated in said shift reaction unit;

said raw material reforming unit and said shift reaction unit contain different catalysts, and said shift reaction unit and said CO oxidation unit being arranged in a manner that said shift reaction unit and said CO oxidation unit can be indirectly heated by heat transfer from the heat source of said

raw material reforming unit, and further said CO oxidation unit being arranged in a position outside said raw material reforming unit;

11 said raw material reforming unit comprising a generally cylindrical combustion chamber as the heat source and a reforming reaction unit for steam-reforming the raw material to produce the reformed gas containing hydrogen as a principal component, said reforming reaction unit, said shift reaction unit and said CO oxidation unit are concentrically arranged relative to said combustion chamber; and

12 further comprising an exhaust chamber, in which a burned exhaust gas from said combustion chamber directly flows, wherein said exhaust chamber is positioned adjacent to and coaxially above said combustion chamber, said shift reaction unit being positioned outside said exhaust chamber, said CO oxidation unit being positioned outside said shift reaction unit.

13. (Thrice Amended) A reforming apparatus comprising an integrated structure of three separate units, comprising:

14 a raw material reforming unit for steam-reforming a raw material to be reformed and producing a reformed gas containing hydrogen as a principal component, including a heat source that generates heat by combustion of a fuel gas, operable to directly obtain heat for the steam reformation reaction from said heat source;

15 a shift reaction unit for decreasing, by water-gas-shift reaction, CO contained in the reformed gas produced in said raw material reforming unit; and

16 a CO oxidation unit for further decreasing, by oxidation, CO contained in reformed gas treated in said shift reaction unit;

02 said raw material reforming unit and said shift reaction unit contain different catalysts, and said shift reaction unit and said CO oxidation unit being arranged in a manner that said shift reaction unit and said CO oxidation unit can be indirectly heated by heat transfer from the heat source of said raw material reforming unit, and further said CO oxidation unit being arranged in a position outside said raw material reforming unit;

02 said raw material reforming unit comprising a generally cylindrical combustion chamber as the heat source and a reforming reaction unit for steam-reforming the raw material to produce the reformed gas containing hydrogen as a principal component, said reforming reaction unit, said shift reaction unit and said CO oxidation unit are concentrically arranged relative to said combustion chamber; and

02 at least one of said reforming reaction unit, said shift reaction unit and said CO oxidation unit is provided on a surface thereof with a heat transfer material having a higher heat conductivity than that of a material of which said surface is composed.

03 30. (Thrice Amended) A reforming apparatus comprising an integrated structure of four separate units, which comprises:

03 a combustion unit for generating heat by combustion of a fuel gas;

03 a raw material reforming reaction unit for steam-reforming a raw material and producing a reformed gas containing hydrogen as a principal component;

03 a shift reaction unit for decreasing CO contained in the reformed gas, that was produced in said raw material reforming unit, by water-gas-shift reaction;